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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,729	10/23/2003	Charles D. Jaquays	1014	7684
7590 08/02/2006				
Donald A. Kettlestrings, Esq. Suite 211 414 Hungerford Drive Rockville, MD 20850			EXAMINER MARCANTONI, PAUL D	
			ART UNIT 1755	PAPER NUMBER

DATE MAILED: 08/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/690,729	Applicant(s) JAQUAYS, CHARLES D.	
	Examiner Paul Marcantoni	Art Unit 1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/19/06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29 and 33-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29 and 33-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

The applicants' amendment of 6/19/06 and arguments have been considered but are not persuasive. The applicants' amendment to the claims and specification necessitated new grounds of rejection:

Objection to the Specification:

The applicants' insertion of the terms ---carbonate---crystals for "carbonaceous" (how applicants state it in their 6/19/06 amendment to specification). It is noted that the actual term in the specification is not "carbonaceous" but "carbonatious" yet neither term necessarily indicates --carbonate--. This is thus held to be a new matter insertion.

35 USC 112 First Paragraph:

Claims 29 and 33-44 are rejected under the first paragraph of 35 USC 112 as the specification as originally filed does not provide support for the invention as is now claimed.

The insertion of the term --carbonate-- in claim 29 would appear to be new matter because the specification only states "carbonatious". It is not seen that applicants meant carbonate necessarily by this term and their amendment even states that the term was "carbonaceous" (and claim 37) so it is not apparent that applicants invention really meant --carbonate--. It is also noted that applicants' own claim 37 also teaches a carbonaceous crystal so it is not clear what the difference is between a carbonaceous crystal and a carbonatious crystal or carbonate crystal. The examiner is not rejecting claim 37 but only commenting on the presence of this term in claim 37.

35 USC 103:

Claims 29 and 33-44 are rejected under 35 USC 103(a) as being unpatentable over Jaques et al. '352, Iwu '567, GB 1474056, GB 1484671 (Gnyra et al.), or JP 55092200 (see also English abstract of this reference) alone or in view of Rusinov '208, Nakagawa et al. '561, Helgesson '086, or Arfaei et al. '751.

Response:

The applicants argue Jaques et al. and take issue with his teaching that “any silica-rich ore which yields amorphous silica upon treatment with an acid is appropriate for use in the present invention.” (col.4, lines 21-25). The examiner holds that “any silica rich ore” is also inclusive of waste materials including “waste” silica ore. Red mud or bauxite tailings are known waste materials that contain silica, iron oxide and alumina and thus are a source of silica. Red mud or bauxite tailings or the waste product resulting from the Bayer process which uses bauxite to make alumina. It is further noted that Jaques et al. teach that “silica waste by product” (of which is inclusive of red mud or bauxite tailings because it is a silica waste by product of the Bayer Process) is used as a silica source as a natural pozzolan (see col.3, lines 51-57).

The applicants hold that there is such a wide range of silica rich substances available and it is unlikely Jaques would use bauxite tailings (or red mud) as a silica source. The examiner disagrees because bauxite tailings or red mud is present in abundant quantities and is known as a silica source. It falls under the genus of “any silica rich ore”. Further, in our eco-environmentally friendly age, certainly one of ordinary skill in the art would look to waste materials as well as raw material sources instead of

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doing more damage to the environment. An example of such a usage of a waste material is fly ash used in making cement/concrete products. One of ordinary skill in the art could also use pristine materials or silica sand but looks to fly ash as well because it is a cheap and abundant source of aggregate that does not further damage to the environment.

It is understood that sodium hydroxide is used in the Bayer process and leads to a red mud of high alkalinity (e.g. pH about 13.2) that must be neutralized to be useful. Again, "any silica rich ore" within Jaques teaching is inclusive of red mud or bauxite tailings and one of ordinary skill in the art would have understood this silica source must be neutralized with sulfuric acid (col.4, lines 30-35).

The applicants also incorrectly allege the examiner is *cherry picking* random teachings from a broad disclosure. The applicants err in their assertion. The teaching of a reference is not cherry picking and a waste material containing silica certainly falls under the teaching of Jaques that "any silica rich ore" can be used for his invention. A reference is not limited to its preferred teaching or preferred embodiments but for all that it realistically teaches. "Any" is inclusive of pristine silica sources as well as waste silica sources.

The applicants also argue that digesting is not the same as neutralizing NaOH and while Jaques may prefer sulfuric acid (the same acid used by applicants) there is no suggestion using the sulfuric acid to neutralize sodium hydroxide and produce sodium sulfate. In rebuttal, again, Jaques teaches the use of silica waste by product from the Bayer process (this silica waste by product is red mud or bauxite mine tailing

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waste) as a source of his silica (col.3, line 54). One of ordinary skill in the art would have understood any residual alkaline material (NaOH) present in the silica source would be neutralized by a strong acid such as sulfuric acid. Further, the reaction to produce sodium sulfate is simply the salt resulting from the reaction of sulfuric acid and residual sodium hydroxide. Even if Jaques did not teach silica waste product (Bayer process red mud/bauxite tailing), he still teaches "any silica rich ore" can be used for his process and he does not limit his invention to pristine sources of silica which applicants seem to opine to be the case. This inclination to consider Jaques excluded from *waste silica* is even presented on page 2 of applicants' specification wherein they state that Jaques et al. describes treating virgin bauxite to produce pozzolan for use in concrete products. Nowhere in this reference does Jaques ever state his invention is limited to a virgin bauxite. This is applicant's interpretation of this reference yet never does Jaques state his invention must be pristine or virgin bauxite as his silica source. Jaques would not mention using silica waste from Bayer process as a silica source but he makes it clear that this red mud/bauxite tailing is one of his sources of silica. Even if it were not so, Jaques still teaches "any silica rich ore" can be used (col.4, line 21) and the term *any* does not exclude a waste silica rich ore.

The applicants also argue Jaques single example and seems to use that as his basis for support of only pristine or virgin bauxite. In rebuttal, a reference is good for all that it realistically teaches and is not limited to examples or preferred embodiments.

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Again, Jaques teaches not only the use of a waste silica source from the Bayer process (of which red mud/bauxite tailings are one), he teaches *any* silica rich ore can be used (col.4, line 21) as a silica source for his invention.

The applicants argue that clearly Jaques has no interest in or cognizance of neutralizing sodium hydroxide in bauxite tailings or in assuring that a sodium sulfate residue remains in the treated product. Applicants further state that their claims state that their slurry is not washed , but Jaques washes his product four times (col.5, line 19). In rebuttal, just exactly how does one wash a "slurry"? Is a slurry not already liquid or water containing so this procedure would appear to be impossible. It would appear applicants meant they do not wash their silica waste *residue* (see p.6, second paragraph of applicants' specification). This point is not a suggestion but only an observation of what applicants are presently claiming as their invention. Applicants presently claim they do not wash a slurry which would appear to be an impossible task. It is possible to wash a solid residue product but the examiner can only go with what applicants are claiming as their invention. It is also noted that page 6, second paragraph of applicants' specification states that the residue (the silica waste product after treatment with sulfuric acid) does not need to be washed. The implication here is that it could be washed so nowhere in applicants' disclosure does it state that the residue (not slurry) must not be washed. It is the examiner's position that the fact that applicants state "it need not be washed" means washing is an obvious design choice for one of ordinary skill in the art.

Also, one of ordinary skill in the art would have understood that the supernatant fluid is a salt solution containing sodium sulfate (from the reaction of sodium hydroxide and sulfuric acid) and could have recovered that salt product by known techniques for obtaining salt from a salt solution (such as evaporation). While Jaques does not teach recovery of a salt, this would have been within the obvious design choice of one of ordinary skill in the art.

The applicants also argue that the waste product of Jaques is not red mud or bauxite mine tailings and is allegedly a different waste product from red mud (also known as bauxite mine tailings waste). The applicants call it a "desilication product" (silica slurry waste?-see col.3, line54) which is a small portion of the waste stream generated by the Bayer Process. The examiner has read the literature regarding the Bayer process and it would appear the only predominant Bauxite residue seems to be red mud (bauxite tailings) and he could not find any other waste material such as applicants' "desilication product". It is the examiner's position that red mud contains up to 50% silica and is the silica waste Jaques had in mind for his silica source. Also, even assuming Jaques was not referring to red mud (bauxite tailings) as his silica source, he still teaches that his invention is inclusive of "any silica rich ore" and does not limit his invention to pristine virgin silica ore materials and would be inclusive of waste silica materials. Red mud (bauxite mine tailings) are a rich source of silica that is notoriously known in the art and it would have been an obvious design choice to use any rich silica source for Jaques' process to make a pozzolan material.

The applicants also argue the importance of particle size for making the waste red mud/bauxite tailings a fine powder of specific mesh/particle size prior to treatment with sulfuric acid. Yet, one of ordinary skill in the art would understand the importance of reducing the particle size of the waste to effectively increase the surface area of individual particles and allow for greater reaction with sulfuric acid. The use of crushed powder over clumpy aggregate would certainly have been understood by one of ordinary skill in the art, especially the chemical arts.

The applicants next argue Iwu which teaches a process for treating red mud. Iwu has the *exact range of pH of 5.5 to 6 as applicants* after treatment with a strong acid such as hydrochloric acid or sulfuric acid (col.1, lines 15-23). Iwu *is not limited* to hydrochloric acid because as stated previously he teaches sulfuric acid may also be used and of course the salts resulting (sodium sulfate or sodium chloride) depends upon whether sulfuric acid or sodium chloride is used as the strong acid (see col.1 lines 20-23). The applicants state Iwu sees no reason to use sulfuric acid. In rebuttal, this contradicts the teaching of the reference as stated above as Iwu teaches either hydrochloric acid or sulfuric acid may be used for his invention. The applicants also argue that Iwu requires washing of residue. Again, applicants themselves do not require that the residue must be washed. On page 6, paragraph 2 of applicants' specification, applicants even state that the "residue does not need to be washed". The applicants do not state that the residue *must* not be washed and thus it is the examiner's position that washing or not washing the residue would have been an obvious design choice for one of ordinary skill in the art.

The applicants argue the GB 1474056 teach essentially the recovery of sodium chloride (ie from using hydrochloric acid) from red mud. The applicants admit that sulfuric acid is mentioned *briefly* as producing a contaminated product with no suggestion or recognition of the advantage of using sodium sulfate remaining in the unwashed residue. The fact that it is mentioned briefly is sufficient to show that GB '056 teaches the applicants' claims. GB '056 teaches red mud (bauxite tailings) may be treated with either sulfuric acid or hydrochloric acid and the salt resulting (sulfate or chloride) depends on the acid used (see col.1 lines 35-40). This is the applicants' claimed process. The applicants also argue that their residue is unwashed. In rebuttal, applicants themselves do not require that the residue must be washed. On page 6, paragraph 2 of applicants' specification, applicants even state that the "residue does not need to be washed". The applicants do not state that the residue *must* not be washed and thus it is the examiner's position that washing or not washing the residue would have been an obvious design choice for one of ordinary skill in the art.

The applicants argue that GB 1484671 (Gnyra et al.) teaches neutralizing red mud (bauxite tailings) by mixing with sulfuric acid or hydrochloric acid to a pH of 6.6 to 7.3. The examiner disagrees that Gnyra et al. is limited to this pH range because that is only representative of the pH of the specific examples. Gnyra et al. is not limited to the pH of the examples. Yet, a reference is good for all that it realistically teaches and Gnyra states that products of somewhat different effectiveness can be produced by variation of the relative proportions of acid to red Mud (p.2, lines 20-22). Gnyra et al.

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further teach that red mud (bauxite tailings) can be directly treated with sulfuric acid (claim 1) and even teaches that red mud can be treated with concentrated sulfuric acid (p.2, lines 10-12). It is also noted that F-3 (example of 100 parts Red Mud/110 parts of sulfuric acid) is not listed in Table II but this is the most concentrated amount of sulfuric acid and would lead to a pH in applicants' claimed range. The applicants' claimed process and product is essentially mixing red mud with a concentrated mineral acid (e.g. sulfuric acid) to obtain a specific pH range of 5.5 to 6 and then using that residue product from this reaction for other intended uses such as cement but not limited to cement and the stabilized bauxite tailings (from sulfuric acid treatment) can be used for filtration media, topsoil supplement, landfill capping, UV shielding in plastics, pigment for paint, plastics, ceramics and a non-polluting marker for surface water hydrology analysis (See p.9, third paragraph of applicants' specification). The applicants cannot assert that they make a building material because claim 29 merely contains the intended use (ie "for a component of a cementitious product). The applicants' own specification clearly teaches there usages or not limited to a building product and the intended use is not relevant to the claimed process which is directed to treating red mud with sulfuric acid and removing the salt (sulfate) from the supernatant fluid and isolating the red mud silica residue formed.

Gnyra does not need to teach the intended use either (ie as applicants call it Gnyra's polluted residue which is the same as the polluted residue they make by mixing red mud (bauxite tailings) and sulfuric acid). The applicants also state that Gnyra teaches a pH for samples F1 through F3 as being 3.8, 3.1, and 2.8 respectively (p.2,

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line 56). While the examiner *agrees* that these examples teach different pH values than applicants' claims (e.g. applicants' claim 29 pH value is 5.5 to 6), a reference is not limited to the specific examples or preferred embodiments. Gnyra teaches that a more dilute sulfuric acid can be used such as pickling solution waste (p.2, lines 14-15) which would lead to a higher pH and also again Gnyra teaches products of somewhat different effectiveness can be produced by variation of the relative proportions of acid to red Mud (p.2, lines 20-22) which would lead to a variation of pH range as well including a pH within applicants' claimed range.

The applicants also argue that JP '200 the intended use does not state cement and the examiner is using a healthy dose of hindsight. In rebuttal, applicants are reminded of their duty to conduct prosecution with courtesy and decorum and their snide comment (healthy dose of hindsight) is not appreciated by this examiner nor is it helpful to advancement of prosecution of the instant application. It is hoped and expected that applicants can refrain from similar comments and conduct prosecution in a professional manner. Applicants cooperation in this matter is appreciated.

The applicants should note that their claim 29 now has the limitation that they further treat the insoluble slurry to form a *component of cementitious building material (intended use)*. The applicants do not actually teach mixing their residue formed from mixing red mud (bauxite) and sulfuric acid which is within the teaching of JP '200 (as it teaches mixing red mud with sulfuric acid) with cement so the intended use for adding at a later point to cement is not relevant. That same component made by applicants' process can also have use as filtration media, topsoil supplement, landfill capping, UV

shielding in plastics, pigment for paint, plastics, ceramics and a non-polluting marker for surface water hydrology analysis (See p.9, third paragraph of applicants' specification).

The applicants also argue regarding sodium sulfate. Sodium sulfate is formed by the reaction of red mud and sulfuric acid. The other primary references already teach that removing sodium sulfate (the supernatant) from the residue and solution can be done by evaporation and this is old in the art. The treatment of the supernatant liquid containing the sulfate salt to obtain this salt would have been an obvious design choice of ordinary skill in the art. This supernatant can be saved to obtain sulfate salt or it can be discarded. Nevertheless, JP '200 also teaches the product formed of claim 44 which is the residue formed by mixing red mud with sulfuric acid in applicants' pH range.

The applicants also argue the reference does not teach washing. In rebuttal, applicants themselves do not require that the residue must be washed. On page 6, paragraph 2 of applicants' specification, applicants even state that the "residue does not need to be washed". The applicants do not state that the residue *must* not be washed and thus it is the examiner's position that washing or not washing the residue would have been an obvious design choice for one of ordinary skill in the art.

The examiner maintains that sodium sulfate, if present, as a residual material in the silica final product is used in cement that it would function as a catalyst such as an accelerator. That is the motivation to combine these secondary references. The applicants appear to argue the references individually because they note, for example in Rusinov that he does not teach mine tailings. The applicants argue this reference

individually and only uses Rusinov and other secondary references to show the catalytic action/effect of sodium sulfate in cement.

It is the examiner's position that he has fully responded to applicants' arguments and the finality of this office action is now proper. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Marcantoni whose telephone number is 571-272-1373. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Paul Marcantoni', is positioned above the printed name.

Paul Marcantoni
Primary Examiner
Art Unit 1755